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Applicant(s): JAMIESON et al.
Serial No.: 09/346,412
Confirmation No.: 2387
Filed: July 1, 1999
For: PROCESS VARIABLE GAUGE INTERFACE AND METHODS REGARDING SAME

Group Art Unit: 2174
Examiner: Lylinh T. Tran

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The 35 U.S.C. §103 Rejection

The Examiner rejected claims 1, 6, 9-10, 16, 24, 29, 33, 41, 43 and 58 under 35 U.S.C. §103(a) as being unpatentable over Michener et al. (U.S. Patent No. 4,745,543) in view of Harrow et al. (U.S. Patent No. 5,375,199). The Examiner also rejected claims 11-15, 17-19, 34-40, 42 and 44-45 as being unpatentable over Michener et al. (U.S. Patent No. 4,745,543) in view of Harrow et al. (U.S. Patent No. 5,375,199) and further in view of Schaefer et al. (U.S. Patent No. 4,675,147). The Examiner also rejected claims 20-23 and 46-48 as being unpatentable over Michener et al. (U.S. Patent No. 4,745,543) in view of Harrow et al. (U.S. Patent No. 5,375,199) and further in view of van Weele et al. (U.S. Patent No. 5,631,825).

In each case, the Examiner relies on Michener et al. as a primary reference to describe the elements of the claims, and also partially on Harrow et al. Applicants respectfully traverse the rejection of the claims (both previous rejections and this final rejection) and respectfully submit that the remarks provided in response to the previous Office Action clearly set forth the patentability of such claims over the references cited. However, to further supplement and highlight particular elements of the pending claims which are clearly missing in the references cited, the following remarks are provided.

In each of independent claims 1, 24, and 58, Applicants teach a graphical user interface and/or method for providing a graphical user interface to a user for a process that is operable under control of one or more process variables. Generally, the graphical user interface includes a scale extending along a gauge axis and one or more bars extending along the gauge axis. Each bar is representative of a set of high and low process limit values for a process variable. For example, as described in claim 1, the one or more bars extending along the gauge axis include:

a first bar extending along the gauge axis, wherein a first end of the first bar is representative of an engineering hard high limit for the process variable and a second end of the first bar is representative of an engineering hard low limit for the process variable, wherein the first end and second end of the first bar representative of the engineering hard high and hard low limits define a range in which operator set high and low limits are set; and

a second bar extending along the gauge axis, wherein a first end of the second bar is representative of the operator set high limit for the process variable and a second end of the second bar is representative of the operator set low limit for the process variable, wherein the first end and second end of the second bar representative of the operator set high and low limits define a range in which the process is free to operate.

Further, generally, such independent claims include a graphical shape displayed along the gauge axis representative of a current value of the process variable. Independent claims 24 and 58 include similar limitations.

In the Examiner's response to arguments, the Examiner continues to assert that Applicants rely on features not recited in the claims. It is believed that this assertion is the result of the inclusion in the Applicants previous response of the following description given in the specification for various "limit" terms:

> As used herein, engineering physical limit values refer to limit values that define the physical limits of a piece of equipment or instrumentation. They represent the widest possible range of meaningful quantification of a process variable. For example, there may be engineering physical limits to measurements that a sensor may be able to provide.
>
> As used herein, engineering hard limit values are those limit values set by a user, particularly a control engineer, to establish a range over which an operator or another user can safely set operator set limit values.
>
> As used herein, operator set limit values are limit values through which operators exert influence on the controller 14. Such limits establish the range in which the control solution is free to act when it is afforded sufficient degrees of freedom.
>
> Lastly, as used herein, optimization soft limits, or otherwise referred to herein as delta soft bands, are pseudo limits describing an offset within the operator set limits that the optimization calculations will attempt to respect.

Inclusion of such material was meant to provide for a clearer understanding of the limitations. However, any portion of such description necessary to overcome the cited references has been included in the claims.

To establish a *prima facie* case of obviousness, the prior art references must teach or suggest all the claim limitations. Applicants respectfully submit that Michener et al. fails to teach or suggest all the claim limitations of the independent claims 1, 24, and 58; and further that Harrow does nothing to correct for such deficiency.

For example, contrary to the Examiner's position, Michener et al. fails to teach or suggest the provision of or the displaying of **a first bar extending along the gauge axis, wherein a first end of the first bar is representative of an engineering hard high limit for the process variable and a second end of the first bar is representative of an engineering hard low limit for the process variable (i.e., wherein the first end and second end of the first bar representative of the engineering hard high and hard low limits define a range in which operator set high and low limits are set) and a second bar extending along the gauge axis, wherein a first end of the second bar is representative of the operator set high limit for the process variable and a second end of the second bar is representative of the operator set low limit for the process variable (i.e., wherein the first end and second end of the second bar representative of the operator set high and low limits define a range in which the process is free to operate).**

The Examiner in the response to Applicants' arguments asserts that Michener et al. teaches "a first pair of high and low limit elements (controlled variables) for the corresponding process variable (figure 2, (0-100), column 47-63) that define a range in which operator set high and low values are set (figure 2); a second pair of high and low limit elements representative of operator set high and low limit values elements (manipulated variables) (figure 2, (S3, S4), column 5, lines 56-65)".

First, some general errors in this statement must be noted. The Examiner is for some reason equating "a first pair of high and low limit elements" with "(controlled variables)" and also "a second pair of high and low limit elements representative of operator set high and low limit values elements" with "(manipulated variables)". This is incorrect, in that both a first pair of high and low limit elements and a second pair of high and low limit elements are provided for a single process variable (e.g., one or more bars for a process value as recited in claim 1).

Further, with respect to "a first pair of high and low limit elements (controlled variables) for the corresponding process variable being shown at "figure 2, (0-100), column 47-63)" of Michener et al., such a first pair of high and low limit values is not shown, described or taught as alleged by the Examiner at this location or any other location in Michener et al..

It appears that the Examiner equates the display of the first pair of high and low limit elements representative of engineering hard high and low limit values for the corresponding process variable (e.g., those that define a range in which operator set high and low limit values are set) to the scale of 0-100 in Michener et al. The values 0 and 100 on the scale have in no manner been described by Michener et al., and it is not taught or suggested by Michener et al., that such values are engineering hard limit values that establish a range over which an operator or another user can safely set operator set limit values (e.g., engineering hard limit values set by a user, particularly a control engineer). The 0 and 100 are merely part of a 0-100% scale and are not functional limit values. They are not indicated as being a limit on anything, upper or lower, for the process variable.

Even if for some reason (e.g., a reason that is clearly beyond the comprehension of Applicants) the scale of 0-100 in Michener et al. could be equated with a first pair of high and low limit elements representative of engineering hard high and low limit values for the corresponding process variable, the "0" and "100" values of Michener et al. are not values that establish a range over which an operator or another user can safely set operator set limit values because such operator set limit values do not exist in Michener et al..

With respect to a second pair of high and low limit elements representative of operator set high and low limit values elements, the Examiner states that such a second pair of high and low limit elements is shown at "(figure 2, (S3, S4), column 5, lines 56-65)" of Michener et al.. Such a second pair of high and low limit elements is not shown, described or taught at this location or any other location in Michener et al..

First, the Examiner must look at the entire statement recited in the claims for the second pair of high and low limit elements. The Examiner must show a **first end and second end of a second bar representative of the operator set high and low limit values for the**

corresponding process variable which define a range in which the process is free to operate and not just "a second pair of high and low limit elements representative of operator set high and low limit values." In other words, the operator set high and low limit values for the corresponding process variable must define **a range in which the process is free to operate as shown by the ends of the bar.**

The Examiner equates the switches S3 and S4 as described in column 6 of Michener et al. to the second pair of high and low limit elements described in the pending claims. Switches S3 and S4 do not describe high and low limit elements that are displayed on a gauge axis as described in the pending claims. The switches S3 and S4 carry out control functions as described in Michener et al. (e.g., the switches are used to control the single **set point**). For example, operation of one of the switches causes an increase in the set point while the other causes a decrease in the set point. Although the single set point value indicated by the bar graph may get increased or decreased, this in no manner can be construed to be a display of operator set high and low limit values for a corresponding process variable which **define a range in which the process is free to operate**. Rather, the set point is a single value that the operator wants the process to achieve.

The second pair of high and low limit elements according to the present invention are representative of the operator set high and low limit values for the corresponding process variable which define a range in which the process is free to operate and do not necessarily even provide a set point. Rather, the second pair of high and low limit elements are a pair of limits (i.e., two limits) that define a range (e.g., which if dragged to a same value may indicate a set point, but which are clearly to define a range in which the process is free operate) (see pages 32 and 33 of specification of pending application). Michener et al. merely describes a couple of switches that are used to control a single set point (i.e., operation of one of the switches causes an increase in the set point while the other causes a decrease in the set point). There are not two limit elements representative of operator set high and low limit values described in Michener et al.

In other words, switches S3 and S4 do not describe a first end of the second bar representative of the operator set high limit for the process variable and a second end of the second bar representative of the operator set low limit for the process variable; nor does Michener et al. describe the first end and second end of the second bar representative of the operator set high and low limits define a range in which the process is free to operate, as described in the pending claims. The switches S3 and S4 carry out control functions as described in Michener et al. (e.g., the switches are used to control the set point). For example, operation of one of the switches causes an increase in the set point while the other causes a decrease in the set point. Although, it would appear that the single set point value indicated by the bar graph gets increased or decreased, this in no manner can be construed to be a display of a first end of the second bar representative of the operator set high limit for the process variable and a second end of the second bar representative of the operator set low limit for the process variable; nor a first end and second end of the second bar representative of the operator set high and low limits define a range in which the process is free to operate, as described in the pending claims. Rather, the set point is a single value that the operator wants the process to achieve.

Harrow does nothing to cure or provide the lacking elements in Michener et al. Harrow et al. recites a system monitoring device that displays historical or real time information and also allows a user to set, via direct manipulation, a range of values for use by the system. For example, a user interface allows the user to expand the value of an interactive icon 200. The exemplary interactive icon 200 is illustrated in its expanded state on the graph in FIG. 13A where the user can move the range of values along the y-axis by dragging the slider 202 of the interactive icon 200 to change values associated with the interactive icon 200. Harrow et al. indicates that the interactive icon 200 . . . allows a user to set a range of values in relationship to graphically presented data. (Col. 17, line 68 – Col. 18, line 2). In its default condition, the indicator bar 204 of the interactive icon supplies a single crossing threshold represented by a thin line (Col. 18, lines 12-16) for a variable (i.e., CRC errors per hour). Thus, the indicator bar 204 provides a single limit value for a particular variable, i.e., CRC errors per hour.

According to Harrow et al., a user can expand the value of the interactive icon 200 (i.e., the indicator bar 204) into a range of values so that the single limit value for the variable (i.e., CRC errors per hour) is a range designated for control of an alarm. For example, 206 in Figure 13A of Harrow et al. indicates that "46" is the value at which "SOUND ALARM WHEN VALUE RISES ABOVE", and 208 in Figure 13A indicates that "26" is the value at which "CANCEL ALARM WHEN VALUE FALLS BELOW". As such, the values shown at 206 and 208 of Harrow et al. represent an expanded range of values for a single operator limit value used to provide alarm function. In other words, Harrow et al. provides an alarm range at the upper operator limit for the variable being monitored (e.g., CRC errors per hour). Harrow et al. does not show "operator set high and low limit values."

Therefore, for at least the reasons set forth above, the cited references do not show all the claim elements and, as such, the pending independent claims 1, 24, and 58 are not obvious in view of the cited references.

With respect to dependent claims 6, 9-23, 29, 33-48, Applicants respectfully submit that these claims are also patentable as further limitations of respective patentable base independent claims from which they directly or indirectly depend. Furthermore, such claims are each patentable over the cited references based on the subject matter recited respectively therein and Applicant generally traverses the allegations that such claims are obvious over the cited references. As it is sufficiently clear that the independent claims are not obvious in view of the cited references, no further remarks are provided with respect to such claims. Further, Schaefer et al. and van Weele et al. do not cure the deficiencies of Michener et al. and Harrow et al.

Applicants respectfully request reconsideration and allowance of claims 1, 6-24, 27, and 29-58.

Allowable Subject Matter

Applicants acknowledge the Examiner's indication that claims 49-57 are in allowable condition and that claims 7-8, 27, and 30-32 are objected to as being dependent on a rejected base claim, but that they would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. However, Applicants have not

rewritten the objected to claims in independent form as it is believed that the claims upon which they depend are also in allowable condition. However, Applicants reserve the right to rewrite such claims at a later date.

Summary and Request for Examiner Interview Prior to Disposition of Case

It is respectfully submitted that the pending claims are in condition for allowance and notification to that effect is respectfully requested. It would appear that the Examiner is still unclear as to the limitations of the present invention and does not recognize the differences between Applicants' invention and the cited references. It is requested that the Examiner contact Applicants' Representatives at the below-listed telephone number if the case is not allowed to discuss the prosecution of this application when it is taken up for consideration.

Respectfully submitted for
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